

Phase Three: Data Collection and Analysis

Data Analysis Report

Total Maximum Daily Load for Pathogens in San Lorenzo River Estuary, Santa Cruz County, California

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Central Coast Regional Water Quality Control Board
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TABLE OF CONTENTS

Table of Contents.....	1
Tables.....	2
Figures.....	2
1. Project Definition.....	3
1.1. Beneficial Uses	3
1.2. Problem Statement	3
2. Numeric Target	4
3. Data Analysis	4
San Lorenzo River Estuary Fecal Coliform at Trestle Geometric Mean Standard.....	4
San Lorenzo River Estuary Fecal Coliform at Trestle Maximum Standard	6
San Lorenzo River Estuary at Broadway/Laurel Street Bridge Geometric Mean Standard	8
San Lorenzo River Estuary at Broadway/Laurel Bridge Maximum Standard	10
3.1. DNA Fingerprinting.....	12
3.2. Source Categories	13
APPENDIX. San Lorenzo River Estuary Water Quality Data.....	15

TABLES

Table 1. Numeric Targets for San Lorenzo River Estuary	4
Table 2. Santa Cruz County Environmental Health Services Sampling Activity Since January 1, 2000	4
Table 3. San Lorenzo River Estuary Fecal Coliform at Trestle Data Summary (#/100 mL) and Exceedence of Water Contract Recreation Geometric Mean Standard	6
Table 4. San Lorenzo River Estuary Fecal Coliform at Trestle Data Summary (#/100 mL) and Exceedence of Water Contract Recreation Maximum Standard.....	8
Table 5. San Lorenzo River Estuary Fecal Coliform at Broadway/Laurel Street Bridge Data Summary (#/100 mL) and Exceedence of Water Contract Recreation Geometric Mean Standard	10
Table 6. San Lorenzo River Estuary Fecal Coliform at Broadway/Laurel Street Bridge Data Summary (#/100 mL) and Exceedence of Water Contract Recreation Maximum Standard.....	12
Table 7. E. coli Percent Source Contributions to San Lorenzo River Estuary @ Trestle from 2002-2003 (Based on Ribotyping)	13
Table 8. Microbial Source Identification Results 2003-04	14

FIGURES

Figure 1 . San Lorenzo River Estuary Fecal Coliform at Trestle (#/100 mL) and Water Contact Recreation Geometric Mean Standard (January 4, 2000 – February 28, 2005)	5
Figure 2. San Lorenzo River Estuary Fecal Coliform at Trestle (#/100 mL) and Water Contact Maximum Standard (January 4, 2000 through February 28, 2005)	7
Figure 3. San Lorenzo River Estuary Fecal Coliform at Broadway/Laurel Bridge (#/100 mL) and Water Contact Recreation Geometric Mean Standard (January 4, 2000 through February 28, 2005)	9
Figure 4. San Lorenzo River Estuary Fecal Coliform at Broadway/Laurel Street Bridge (#/100 mL) and Water Contact Maximum Standard (January 4, 2000 through February 29, 2005).....	11

1. PROJECT DEFINITION

1.1. Beneficial Uses

The California Regional Water Quality Control Board (Regional Board) is responsible for protecting water resources from pollution and nuisance that may occur as a result of waste discharges. The Regional Board determines beneficial uses (in the *Water Quality Control Plan* (Basin Plan)) that need protection. The Regional Board adopted water quality objectives that are necessary to protect the beneficial water uses in the Basin Plan.

San Lorenzo Estuary beneficial uses cited in the Basin Plan are: Contact and Non-Contact Recreation (REC-1 and REC-2); Wildlife Habitat (WILD); Cold Freshwater Habitat (COLD); Migration of Aquatic Organisms (MIGR); Spawning, Reproduction, and/or Early Development (SPWN); Preservation of Biological Habitats of Special Significance (BIOL); Rare, Threatened, or Endangered Species (RARE); Estuarine Habitat (EST); and Commercial and Sport Fishing (COMM).

1.2. Problem Statement

San Lorenzo River Estuary fecal coliform exceeds the REC-1 (water contact recreation) water quality objectives. Regional Board staff utilized San Lorenzo River Estuary water quality data collected by the Santa Cruz County Environmental Health Services to determine this objective exceedence.

2. NUMERIC TARGET

The most stringent water quality objective applies to the water contact recreation beneficial use. The Basin Plan contains the following REC-1 bacteria objective:

“Fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 200/100 ml, nor shall more than ten percent of total samples during any 30-day period exceed 400/100 ml.”

Often, available datasets do not contain five samples in a 30-day period, so the portion of the objective that is evaluated is that “no more than ten percent of total samples during any 30-day period exceed 400 /100 mL.” One can note that, in instances where fewer than five samples were collected in 30 days, the “ten percent” threshold is exceeded if any one sample exceeds 400 / 100 mL.

Table 1. Numeric Targets for San Lorenzo River Estuary

Fecal Coliform	
Geometric Mean	Maximum
200 MPN/100 mL ^a	400 MPN/100 mL ^b

^a Based on not less than five samples for any 30-day period

^b No more than 10% of total samples during any 30-day period

3. DATA ANALYSIS

Santa Cruz County sampling activities for San Lorenzo River Estuary are shown in the Table below.

Table 2. Santa Cruz County Environmental Health Services Sampling Activity Since January 1, 2000

Station	Number of Samples	Frequency	Period of Record
San Lorenzo River Estuary @ Trestle	293	Weekly	1/4/2000-2/28/2005
San Lorenzo River Estuary Fecal Coliform at Broadway/Laurel Bridge	266	Weekly	1/4/2000-2/28/2005

San Lorenzo River Estuary Fecal Coliform at Trestle Geometric Mean Standard

Figure 1 below shows monthly San Lorenzo River Estuary fecal coliform concentrations at the Trestle from 1/4/2000 to 2/28/2005. The graph displays the REC-1 geometric mean standard. Concentration ranges, the range of concentrations within the 25th -75th

percentile range, the mean concentration, and the median concentration are shown. Fecal coliform mean and median values are below the standard from January through May. From September through December, both the mean and median concentrations exceed the standard.

Figure 1 . San Lorenzo River Estuary Fecal Coliform at Trestle (#/100 mL) and Water Contact Recreation Geometric Mean Standard (January 4, 2000 – February 28, 2005)

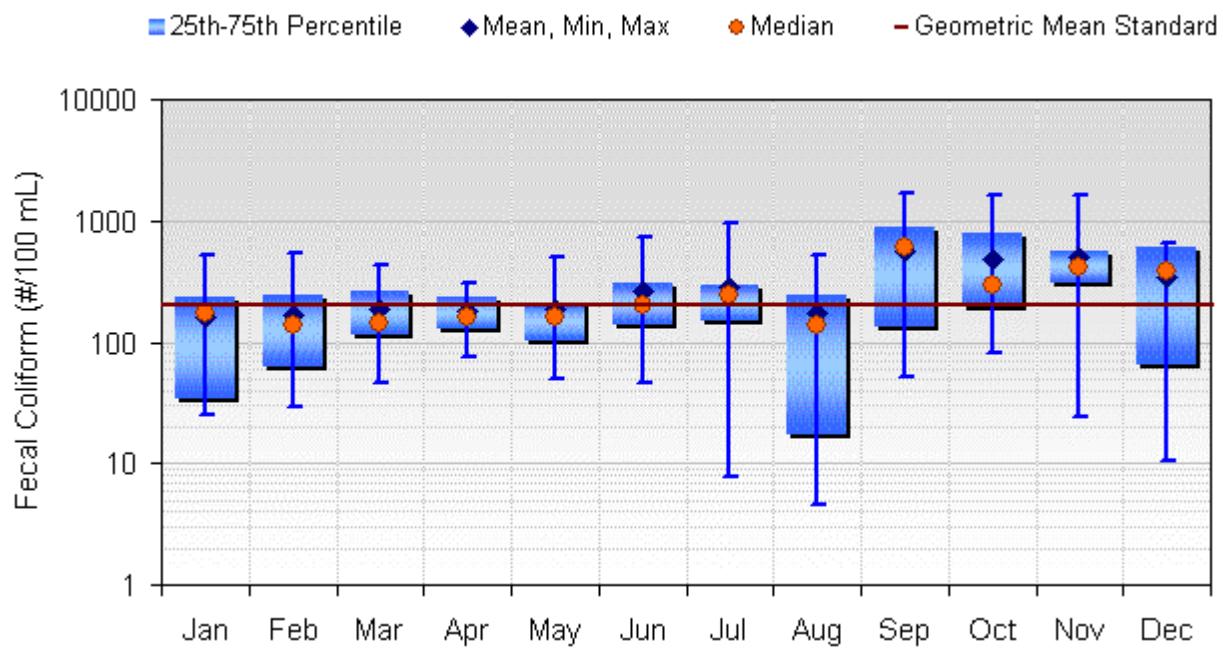


Table 3 below provides a summary of the above figure. The table summarizes data on a monthly basis and presents the mean, median, minimum, maximum, the 25th percent deviation, the 75th percent deviation, the number of exceedences of the water contact recreation geometric mean standard versus the sample count (XS:Count), and the percent sample exceedence (XS%) of the geometric standard. Overall, the water quality objective was exceeded 49% of the time. The least violations occur in February and the greatest number of violations occurs in November. The number of exceedences is slightly less from February though May.

Table 3. San Lorenzo River Estuary Fecal Coliform at Trestle Data Summary (#/100 mL) and Exceedence of Water Contract Recreation Geometric Mean Standard

Summary Statistics (Data: 1/4/2000 to 2/28/2005)								
Month	Mean	Median	Min	Max	25th	75th	XS:Count	XS%
Jan	161	173	25	522	34	238	9:22	41%
Feb	168	137	29	532	62	239	7:22	32%
Mar	185	142	46	430	114	261	8:24	33%
Apr	178	164	74	304	128	233	7:24	29%
May	189	162	50	498	103	212	7:21	33%
Jun	259	200	46	728	136	304	11:23	48%
Jul	280	240	8	955	151	295	15:25	60%
Aug	174	139	5	529	17	242	9:26	35%
Sep	562	608	52	1669	134	870	13:22	59%
Oct	489	295	81	1620	196	775	18:24	75%
Nov	503	417	25	1609	310	562	17:22	77%
Dec	344	383	11	662	66	606	15:24	63%
All Data	290	191	5	1669	102	369	136:279	49%

San Lorenzo River Estuary Fecal Coliform at Trestle Maximum Standard

Figure 2 below shows monthly San Lorenzo River Estuary fecal coliform concentrations at the Trestle from 1/4/2000 to 2/28/2005. The graph displays the water contact recreation maximum standard. Concentration ranges, the range of concentrations within the 25th - 75th percentile range, the mean concentration, and the median concentration are shown. Mean concentrations exceed the standard in February and May through December. The October median concentration also exceeds the standard.

Figure 2. San Lorenzo River Estuary Fecal Coliform at Trestle (#/100 mL) and Water Contact Maximum Standard (January 4, 2000 through February 28, 2005)

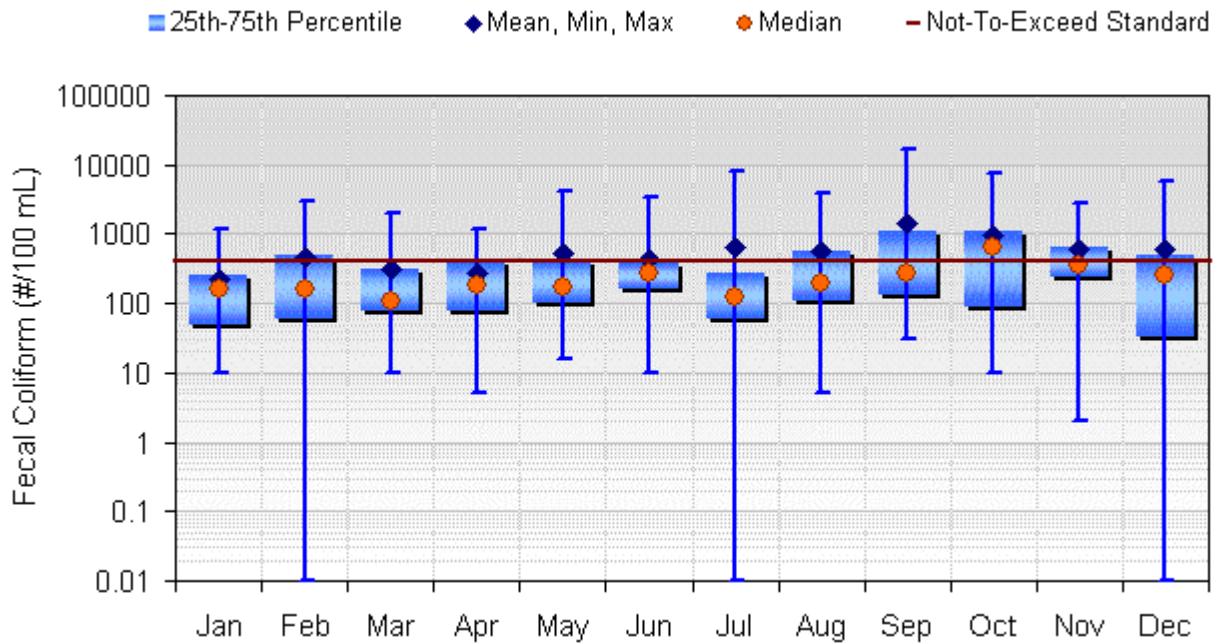


Table 4 below provides a summary of the above figure. The table summarizes data on a monthly basis and presents the mean, median, minimum, maximum, the 25th percent deviation, the 75th percent deviation, the number of exceedences of the geometric mean standard versus the sample count (XS:Count), and the percent sample exceedence (XS%) of the water contact recreation beneficial use maximum standard. Overall, the quality objective was exceeded 29% of the time with no apparent seasonal trend.

Table 4. San Lorenzo River Estuary Fecal Coliform at Trestle Data Summary (#/100 mL) and Exceedence of Water Contract Recreation Maximum Standard

Summary Statistics (Data: 1/4/2000 to 2/28/2005)								
Month	Mean	Median	Min	Max	25th	75th	XS:Count	XS%
Jan	229	160	10	1200	50	255	3:27	11%
Feb	467	160	0	2976	60	500	8:27	30%
Mar	304	110	10	2000	80	305	5:23	22%
Apr	272	185	5	1150	80	420	6:24	25%
May	528	170	16	4170	100	400	5:21	24%
Jun	422	271	10	3350	160	378	6:24	25%
Jul	644	123	0	8040	60	268	4:28	14%
Aug	559	190	5	3910	105	577	7:24	29%
Sep	1445	280	30	16632	135	1110	10:23	43%
Oct	989	645	10	7420	89	1097	14:24	58%
Nov	598	360	2	2780	238	633	8:22	36%
Dec	603	260	0	5760	33	503	10:26	38%
All Data	583	200	0	16632	80	530	86:293	29%

San Lorenzo River Estuary at Broadway/Laurel Street Bridge Geometric Mean Standard

Figure 3 below shows monthly San Lorenzo River Estuary fecal coliform concentrations at the Broadway/Laurel Street from 1/4/2000 to 2/28/2005. The graph displays the geometric mean standard. Concentrations ranges, the range of concentrations within the 25th-75th percentile range, the mean concentration, and the median concentration are shown. Mean concentrations exceed the standard in February and June through December. Median concentrations exceed the standard in June, July, and September through December.

Figure 3. San Lorenzo River Estuary Fecal Coliform at Broadway/Laurel Bridge (#/100 mL) and Water Contact Recreation Geometric Mean Standard (January 4, 2000 through February 28, 2005)

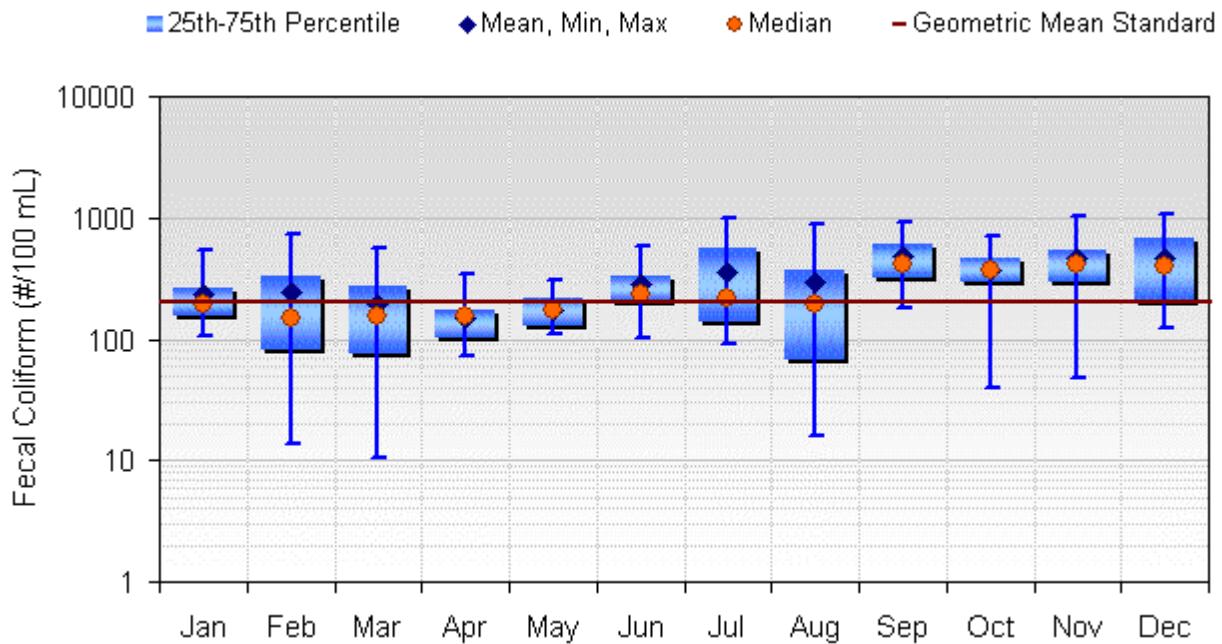


Table 5 below provides a summary of the above figure. The table analyzes data on a monthly basis and presents the mean, median, minimum, maximum, the 25th percent deviation, the 75th percent deviation, the number of exceedences of the water contact recreation geometric mean standard versus the sample count (XS:Count), and the percent sample exceedence (XS%) of the geometric standard. Overall, the water quality objective was exceeded 57% of the time with no apparent seasonal trend.

Table 5. San Lorenzo River Estuary Fecal Coliform at Broadway/Laurel Street Bridge Data Summary (#/100 mL) and Exceedence of Water Contract Recreation Geometric Mean Standard

Summary Statistics (Data: 1/4/2000 to 2/28/2005)								
Month	Mean	Median	Min	Max	25th	75th	XS:Count	XS%
Jan	238	194	106	534	152	262	8:17	47%
Feb	246	147	14	724	81	330	9:20	45%
Mar	198	157	11	570	75	275	8:20	40%
Apr	151	153	72	343	103	173	3:21	14%
May	176	174	108	305	126	214	6:17	35%
Jun	286	233	104	593	204	332	14:19	74%
Jul	360	219	91	994	138	559	10:19	53%
Aug	294	195	16	870	68	375	9:19	47%
Sep	480	413	183	903	316	607	16:17	94%
Oct	370	372	40	711	289	467	16:19	84%
Nov	456	414	48	1016	293	544	16:20	80%
Dec	463	395	121	1068	200	688	17:23	74%
All Data	311	233	11	1068	139	421	132:231	57%

San Lorenzo River Estuary at Broadway/Laurel Bridge Maximum Standard

Figure 4 below shows monthly San Lorenzo River Estuary fecal coliform concentrations at the Broadway/Laurel Street Bridge from 1/4/2000 to 2/28/2005. The graph displays the water contact recreation maximum standard. Concentration ranges, the range of concentrations within the 25th-75th percentile range, the mean concentration, and the median concentration are shown. Mean concentrations exceed the standard in February and July through December.

Figure 4. San Lorenzo River Estuary Fecal Coliform at Broadway/Laurel Street Bridge (#/100 mL) and Water Contact Maximum Standard (January 4, 2000 through February 29, 2005)

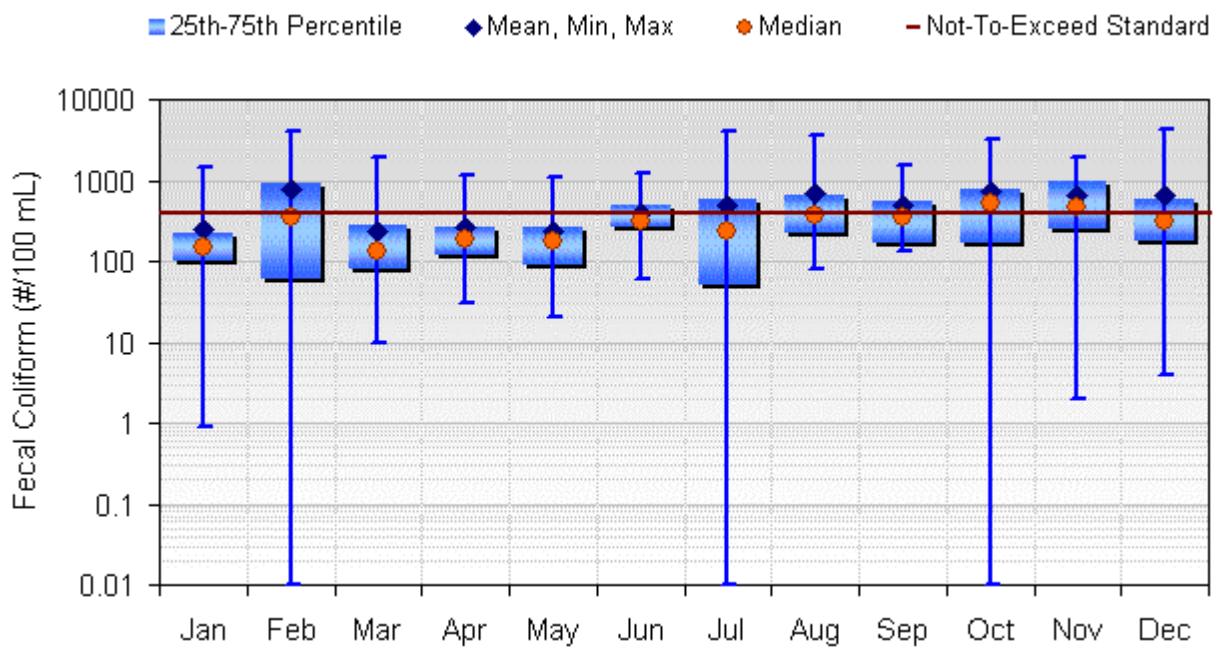


Table 6 below provides a summary of the above figure. The table analyzes data on a monthly basis and presents the mean, median, minimum, maximum, the 25th percent deviation, the 75th percent deviation, the number of exceedences of the geometric mean standard versus the sample count (XS:Count), and the percent sample exceedence (XS%) of the water contact recreation beneficial use maximum standard. Overall, the water quality objective was exceeded 35% of the time. The number of exceedences is lower in March through May.

Table 6. San Lorenzo River Estuary Fecal Coliform at Broadway/Laurel Street Bridge Data Summary (#/100 mL) and Exceedence of Water Contract Recreation Maximum Standard

Summary Statistics (Data: 1/4/2000 to 2/28/2005)								
Month	Mean	Median	Min	Max	25th	75th	XS:Count	XS%
Jan	252	150	1	1430	100	228	6:26	23%
Feb	771	347	0	4000	60	901	9:24	38%
Mar	240	135	10	1900	80	275	2:22	9%
Apr	262	185	30	1140	120	265	3:22	14%
May	239	175	20	1060	88	265	3:20	15%
Jun	393	320	60	1250	260	490	7:21	33%
Jul	485	232	0	3970	50	573	8:24	33%
Aug	698	370	80	3580	216	660	10:21	48%
Sep	479	346	130	1530	167	542	9:20	45%
Oct	711	530	0	3300	170	775	14:22	64%
Nov	635	470	2	1940	250	970	13:21	62%
Dec	645	310	4	4150	180	575	9:23	39%
All Data	484	260	0	4150	121	528	93:266	35%

3.1. DNA Fingerprinting

Santa Cruz County collected water column samples in the Estuary at the Trestle from 2002 to 2004. DNA fingerprinting analysis was performed using the ribotyping method and Dr. Mansour Samadpour of the University of Washington completed the analysis. Dr. Samadpour has a library of over 100,000 fingerprints used to identify *E.coli* sources.

DNA fingerprinting results are shown below. DNA fingerprinting was performed twice, once from 2002-2003 and another from 2003-2004. The greatest *E.coli* source for both tests was birds.

3.2. Source Categories

Table 7. E. coli Percent Source Contributions to San Lorenzo River Estuary @ Trestle from 2002-2003 (Based on Ribotyping)

	San Lorenzo River Mouth (2002-2003)¹
Source	
Avian	39%
Bovine	1%
Canine	5%
Feline	0%
Horse	1%
Human	30%
Marine Mammal	
Rodent	4%
Unknown	15%
Wildlife	4%
Total Isolates	147
Log mean E.coli (cfu/100ml)	434
Human x Log mean (cfu/100ml)	130

¹ Most samples collected during wet periods with some rain in the previous 3 days

Table 8. Microbial Source Identification Results 2003-04

Location	Load	San Lorenzo River Mouth
Total Samples		15
Total Isolates		135
Log mean Fecal Coliform (cfu/100 ml)		272
Bird		51.1%
	Portion of Log Mean Fecal Coliform (cfu/100 ml)	139
Cat		0.0%
	Portion of Log Mean Fecal Coliform (cfu/100 ml)	0
Cow		2.2%
	Portion of Log Mean Fecal Coliform (cfu/100 ml)	6
Dog		7.4%
	Portion of Log Mean Fecal Coliform (cfu/100 ml)	20
Horse		0.7%
	Portion of Log Mean Fecal Coliform (cfu/100 ml)	2
Rodent		9.6%
	Portion of Log Mean Fecal Coliform (cfu/100 ml)	26
Marine Mammal		0.0%
	Portion of Log Mean Fecal Coliform (cfu/100 ml)	0
Unknown		12.6%
	Portion of Log Mean Fecal Coliform (cfu/100 ml)	34
Wildlife		7.4%
	Portion of Log Mean Fecal Coliform (cfu/100 ml)	20
Human		8.9%
	Portion of Log Mean Fecal Coliform (cfu/100 ml)	24

APPENDIX. SAN LORENZO RIVER ESTUARY WATER QUALITY DATA

San Lorenzo River @ Broadway/Laurel Street Bridge	Fecal Coliform (#/100 mL)	San Lorenzo Rivermouth@ Trestle	Fecal Coliform (#/100 mL)
04-Jan-00	0.9	04-Jan-00	20
11-Jan-00	520	11-Jan-00	320
20-Jan-00	640	20-Jan-00	780
26-Jan-00	220	26-Jan-00	340
01-Feb-00	280	01-Feb-00	580
09-Feb-00	2520	09-Feb-00	420
16-Feb-00	820	16-Feb-00	660
24-Feb-00	60	24-Feb-00	120
01-Mar-00	140	01-Mar-00	160
08-Mar-00	1900	08-Mar-00	2000
15-Mar-00	80	15-Mar-00	580
22-Mar-00	200	22-Mar-00	80
29-Mar-00	160	29-Mar-00	100
05-Apr-00	160	05-Apr-00	280
12-Apr-00	250	12-Apr-00	130
19-Apr-00	180	13-Apr-00	324
26-Apr-00	390	19-Apr-00	170
03-May-00	160	26-Apr-00	80
11-May-00	160	03-May-00	120
17-May-00	250	11-May-00	150
24-May-00	1060	17-May-00	450
01-Jun-00	650	24-May-00	210
08-Jun-00	1250	01-Jun-00	310
14-Jun-00	340	08-Jun-00	3350
22-Jun-00	200	14-Jun-00	740
28-Jun-00	270	22-Jun-00	320
06-Jul-00	50	28-Jun-00	830
13-Jul-00	220	06-Jul-00	120
27-Jul-00	160	13-Jul-00	60
02-Aug-00	370	19-Jul-00	120
08-Aug-00	320	27-Jul-00	110
17-Aug-00	408	02-Aug-00	440
30-Aug-00	420	09-Aug-00	120
07-Sep-00	312	17-Aug-00	360
12-Sep-00	280	24-Aug-00	250
28-Sep-00	160	30-Aug-00	200
03-Oct-00		07-Sep-00	3336

San Lorenzo River @ Broadway/Laurel Street Bridge	Fecal Coliform (#/100 mL)	San Lorenzo Rivermouth@ Trestle	Fecal Coliform (#/100 mL)
12-Oct-00	200	12-Sep-00	2480
17-Oct-00	96	19-Sep-00	2928
24-Oct-00	3300	28-Sep-00	50
01-Nov-00	400	03-Oct-00	1252
08-Nov-00	570	12-Oct-00	60
14-Nov-00	2	17-Oct-00	52
20-Nov-00	180	24-Oct-00	52
29-Nov-00	1940	01-Nov-00	170
06-Dec-00	124	06-Nov-00	100
11-Dec-00	312	14-Nov-00	2
20-Dec-00	712	20-Nov-00	5
26-Dec-00	4	29-Nov-00	610
09-Jan-01	410	06-Dec-00	72
16-Jan-01	116	11-Dec-00	148
17-Jan-01	100	20-Dec-00	28
29-Jan-01	430	26-Dec-00	4
06-Feb-01	344	04-Jan-01	12
14-Feb-01	1145	09-Jan-01	220
21-Feb-01	2928	16-Jan-01	44
26-Feb-01	400	22-Jan-01	20
07-Mar-01	130	29-Jan-01	100
12-Mar-01	100	05-Feb-01	
19-Mar-01	290	06-Feb-01	2976
26-Mar-01	390	14-Feb-01	262
02-Apr-01	60	21-Feb-01	336
09-Apr-01	230	26-Feb-01	210
16-Apr-01	30	07-Mar-01	110
24-Apr-01	90	12-Mar-01	50
30-Apr-01	120	19-Mar-01	100
07-May-01	200	27-Mar-01	590
14-May-01	320	02-Apr-01	400
21-May-01	310	09-Apr-01	550
29-May-01	20	16-Apr-01	5
06-Jun-01	780	24-Apr-01	210
11-Jun-01	320	30-Apr-01	20
18-Jun-01	260	07-May-01	190
25-Jun-01	810	14-May-01	80
02-Jul-01	3970	21-May-01	2400
09-Jul-01	500	29-May-01	16
16-Jul-01	1060	06-Jun-01	100
23-Jul-01	570	11-Jun-01	556
31-Jul-01	580	18-Jun-01	80
06-Aug-01	1890	25-Jun-01	490
14-Aug-01	570	02-Jul-01	400

San Lorenzo River @ Broadway/Laurel Street Bridge	Fecal Coliform (#/100 mL)	San Lorenzo Rivermouth@ Trestle	Fecal Coliform (#/100 mL)
20-Aug-01	1400	09-Jul-01	5600
28-Aug-01	310	16-Jul-01	8040
05-Sep-01	380	23-Jul-01	90
10-Sep-01	576	31-Jul-01	60
18-Sep-01	530	07-Aug-01	170
24-Sep-01	290	14-Aug-01	3910
01-Oct-01	450	20-Aug-01	1870
10-Oct-01	760	28-Aug-01	380
15-Oct-01	620	05-Sep-01	1670
22-Oct-01	850	07-Sep-01	280
29-Oct-01	1010	10-Sep-01	16632
05-Nov-01	520	18-Sep-01	1210
15-Nov-01	1760	24-Sep-01	110
19-Nov-01	1210	01-Oct-01	680
26-Nov-01	970	10-Oct-01	7420
03-Dec-01	680	15-Oct-01	1090
10-Dec-01	420	22-Oct-01	400
17-Dec-01	4150	29-Oct-01	1200
26-Dec-01	310	05-Nov-01	2780
03-Jan-02	620	15-Nov-01	1500
07-Jan-02	130	19-Nov-01	1180
14-Jan-02	60	26-Nov-01	1230
24-Jan-02	100	03-Dec-01	20
28-Jan-02	170	10-Dec-01	510
04-Feb-02	10	17-Dec-01	2520
11-Feb-02	50	26-Dec-01	220
19-Feb-02	400	03-Jan-02	860
20-Feb-02		07-Jan-02	160
25-Feb-02	20	24-Jan-02	130
05-Mar-02	80	28-Jan-02	10
11-Mar-02	90	04-Feb-02	5
18-Mar-02	90	11-Feb-02	20
25-Mar-02	60	12-Feb-02	20
03-Apr-02	60	19-Feb-02	280
08-Apr-02	230	25-Feb-02	50
15-Apr-02	1140	26-Feb-02	160
29-Apr-02	120	05-Mar-02	100
07-May-02	30	11-Mar-02	110
13-May-02	140	18-Mar-02	130
20-May-02	590	25-Mar-02	220
28-May-02	80	03-Apr-02	110
03-Jun-02	60	08-Apr-02	640
18-Jun-02	170	15-Apr-02	1150
26-Jun-02	490	24-Apr-02	50

San Lorenzo River @ Broadway/Laurel Street Bridge	Fecal Coliform (#/100 mL)	San Lorenzo Rivermouth@ Trestle	Fecal Coliform (#/100 mL)
02-Jul-02	40	29-Apr-02	200
09-Jul-02	350	07-May-02	4170
16-Jul-02	50	13-May-02	100
23-Jul-02	180	20-May-02	400
30-Jul-02	120	21-May-02	940
06-Aug-02	240	28-May-02	140
13-Aug-02	660	03-Jun-02	90
20-Aug-02	120	11-Jun-02	10
27-Aug-02	210	18-Jun-02	80
04-Sep-02	470	26-Jun-02	20
10-Sep-02	1350	02-Jul-02	230
19-Sep-02	140	03-Jul-02	
23-Sep-02	169	09-Jul-02	60
02-Oct-02	490	23-Jul-02	10
07-Oct-02	124	30-Jul-02	630
15-Oct-02	110	06-Aug-02	60
23-Oct-02	1860	13-Aug-02	60
30-Oct-02	570	20-Aug-02	5
04-Nov-02	150	27-Aug-02	130
12-Nov-02	250	04-Sep-02	170
18-Nov-02	200	10-Sep-02	100
25-Nov-02	510	19-Sep-02	80
03-Dec-02	920	25-Sep-02	248
10-Dec-02	470	01-Oct-02	190
17-Dec-02	470	07-Oct-02	1116
23-Dec-02	240	15-Oct-02	90
30-Dec-02	160	23-Oct-02	610
07-Jan-03	130	30-Oct-02	950
13-Jan-03	100	04-Nov-02	350
21-Jan-03	76	12-Nov-02	370
26-Jan-03	150	18-Nov-02	230
28-Jan-03	190	25-Nov-02	270
04-Feb-03	70	03-Dec-02	1200
10-Feb-03	20	10-Dec-02	480
18-Feb-03	90	17-Dec-02	630
27-Feb-03	640	18-Dec-02	260
05-Mar-03	280	23-Dec-02	30
13-Mar-03	20	30-Dec-02	380
17-Mar-03	320	07-Jan-03	190
25-Mar-03	20	13-Jan-03	300
01-Apr-03	330	21-Jan-03	1200
08-Apr-03	270	26-Jan-03	50
15-Apr-03	510	28-Jan-03	180
23-Apr-03	130	04-Feb-03	220

San Lorenzo River @ Broadway/Laurel Street Bridge	Fecal Coliform (#/100 mL)	San Lorenzo Rivermouth@ Trestle	Fecal Coliform (#/100 mL)
28-Apr-03	800	10-Feb-03	20
05-May-03	90	18-Feb-03	140
13-May-03	40	27-Feb-03	720
20-May-03	50	05-Mar-03	310
27-May-03	220	13-Mar-03	30
03-Jun-03	500	17-Mar-03	1190
11-Jun-03	340	25-Mar-03	50
18-Jun-03	370	01-Apr-03	550
23-Jun-03	264	08-Apr-03	80
01-Jul-03	30	15-Apr-03	480
07-Jul-03	50	23-Apr-03	100
14-Jul-03	340	28-Apr-03	530
21-Jul-03	140	05-May-03	170
29-Jul-03	244	13-May-03	170
04-Aug-03	80	20-May-03	40
11-Aug-03	300	27-May-03	700
19-Aug-03	1868	03-Jun-03	280
26-Aug-03	540	11-Jun-03	240
02-Sep-03	830	18-Jun-03	310
08-Sep-03	470	23-Jun-03	272
15-Sep-03	1530	01-Jul-03	180
23-Sep-03	1020	07-Jul-03	140
29-Sep-03	135	14-Jul-03	180
06-Oct-03	470	21-Jul-03	126
14-Oct-03	160	29-Jul-03	400
20-Oct-03	750	04-Aug-03	56
27-Oct-03	640	11-Aug-03	988
04-Nov-03	500	19-Aug-03	1324
12-Nov-03	430	26-Aug-03	1220
17-Nov-03	410	02-Sep-03	800
24-Nov-03	1200	08-Sep-03	400
01-Dec-03	3280	15-Sep-03	1010
09-Dec-03	320	23-Sep-03	710
15-Dec-03	200	29-Sep-03	416
22-Dec-03	260	06-Oct-03	580
31-Dec-03	140	14-Oct-03	10
05-Jan-04	170	20-Oct-03	840
12-Jan-04	220	21-Oct-03	240
20-Jan-04	60	27-Oct-03	3100
02-Feb-04	350	28-Oct-03	900
17-Feb-04	1330	04-Nov-03	640
23-Feb-04	60	05-Nov-03	260
01-Mar-04	420	12-Nov-03	290
08-Mar-04	10	17-Nov-03	380

San Lorenzo River @ Broadway/Laurel Street Bridge	Fecal Coliform (#/100 mL)	San Lorenzo Rivermouth@ Trestle	Fecal Coliform (#/100 mL)
15-Mar-04	260	24-Nov-03	490
22-Mar-04	50	01-Dec-03	5760
29-Mar-04	180	08-Dec-03	820
06-Apr-04	80	09-Dec-03	330
12-Apr-04	160	15-Dec-03	260
19-Apr-04	230	22-Dec-03	410
26-Apr-04	190	31-Dec-03	420
03-May-04	100	05-Jan-04	100
10-May-04	190	12-Jan-04	160
17-May-04	190	20-Jan-04	20
26-May-04	580	21-Jan-04	50
01-Jun-04	260	02-Feb-04	70
09-Jun-04	430	09-Feb-04	120
15-Jun-04	85	17-Feb-04	1180
21-Jun-04	100	23-Feb-04	50
29-Jun-04	310	01-Mar-04	440
07-Jul-04	1330	08-Mar-04	10
12-Jul-04	690	15-Mar-04	170
19-Jul-04	650	22-Mar-04	80
27-Jul-04		23-Mar-04	300
29-Jul-04	304	29-Mar-04	80
30-Jul-04		06-Apr-04	50
04-Aug-04	100	12-Apr-04	140
09-Aug-04	216	19-Apr-04	200
16-Aug-04	3580	26-Apr-04	70
23-Aug-04	920	03-May-04	80
30-Aug-04	130	10-May-04	30
08-Sep-04	130	17-May-04	290
13-Sep-04	130	26-May-04	240
20-Sep-04	470	01-Jun-04	200
27-Sep-04	200	09-Jun-04	270
04-Oct-04	360	15-Jun-04	190
13-Oct-04	50	16-Jun-04	620
18-Oct-04	2000	21-Jun-04	340
27-Oct-04	780	24-Jun-04	240
01-Nov-04	310	29-Jun-04	180
08-Nov-04	1280	07-Jul-04	600
15-Nov-04	470	12-Jul-04	120
22-Nov-04	70	19-Jul-04	290
01-Dec-04	70	20-Jul-04	210
06-Dec-04	90	27-Jul-04	
13-Dec-04	300	28-Jul-04	
21-Dec-04	200	29-Jul-04	260
28-Dec-04	1000	30-Jul-04	

San Lorenzo River @ Broadway/Laurel Street Bridge	Fecal Coliform (#/100 mL)	San Lorenzo Rivermouth@ Trestle	Fecal Coliform (#/100 mL)
05-Jan-05	230	31-Jul-04	
10-Jan-05	1430	02-Aug-04	160
19-Jan-05	40	04-Aug-04	170
24-Jan-05	90	09-Aug-04	232
31-Jan-05	150	16-Aug-04	30
07-Feb-05	4000	18-Aug-04	180
14-Feb-05	90	23-Aug-04	1050
21-Feb-05	630	30-Aug-04	40
28-Feb-05	2240	08-Sep-04	190
		13-Sep-04	30
		20-Sep-04	160
		21-Sep-04	176
		27-Sep-04	50
		04-Oct-04	84
		13-Oct-04	80
		18-Oct-04	2000
		27-Oct-04	736
		01-Nov-04	270
		08-Nov-04	1630
		15-Nov-04	370
		22-Nov-04	30
		01-Dec-04	30
		06-Dec-04	20
		13-Dec-04	200
		20-Dec-04	
		21-Dec-04	40
		28-Dec-04	880
		05-Jan-05	170
		10-Jan-05	200
		19-Jan-05	120
		24-Jan-05	290
		31-Jan-05	150
		07-Feb-05	90
		14-Feb-05	100
		21-Feb-05	2190
		28-Feb-05	1610